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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 04/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/431,201

Applicant(s)

SATOH ET AL.

Examiner

Thomas M. Dougherty

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,6,9,11-16 and 22-26 is/are rejected.
- 7) ☐ Claim(s) 2,4,5,7,8,10 and 17-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### ***Response to Arguments***

Applicant's arguments filed 03/20/02 have been fully considered but they are not persuasive. The prior art cited in the rejection of the unamended claims reads on the claimed structures. While the Applicants regard the prior art as insufficient based on the explanation of the invention as shown in the figures, note that the Applicants misinterpret, the principle that the claims are interpreted in the light of the specification. Although elements may be found as examples or embodiments in the specification, they were not claimed explicitly. Nor were the words that are used in the claims defined in the specification to require these limitations. A reading of the specification provides no evidence to indicate that these limitations must be imported into the claims to give meaning to disputed terms. *Constant v. Advanced Micro-Devices Inc.*, 7 USPQ2d 1064.

Additionally, *in arguendo*, were the Applicants' contention that the areal range of the visco-elastic member cannot be arbitrarily determined by sight, note that it would have nevertheless been obvious to one having ordinary skill in the art at the time the relied-upon, prior art inventions were made to have such an areal range as that claimed by the Applicants since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Miki (JP 3-175800). Miki shows (figs. 1a, 1b) a piezoelectric loudspeaker (see title) comprising: a piezoelectric vibrator including a diaphragm (2) and a piezoelectric member (1) provided on at least one face of the diaphragm (2); a frame (5) for supporting the piezoelectric vibrator; and a visco-elastic (6) member provided on at least one face of the piezoelectric vibrator, wherein the visco-elastic member (6) is disposed in a substantial center of the piezoelectric vibrator, and wherein the visco-elastic member has a bottom face area (determined by sight) which accounts for about 11% to about 80% of a bottom face area of the diaphragm (2).

Claims 1, 3, 6, 9 and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kishi (US 4,654,554). Kishi shows (figs. 30, 33) a piezoelectric loudspeaker (see abstract) comprising: a piezoelectric vibrator including a diaphragm (117) and a piezoelectric member (119) provided on at least one face of the diaphragm (117); a frame (conic member) for supporting the piezoelectric vibrator; and a visco-elastic (121) member provided on at least one face of the piezoelectric vibrator, wherein the visco-elastic member (121) is disposed in a substantial center of the piezoelectric vibrator, and wherein the visco-elastic member (121) has a bottom face area (determined by sight) which accounts for about 11% to about 80% of a bottom face area

of the diaphragm (117). The visco-elastic member (121) comprises first and second visco-elastic members (121) which are provided on opposite sides of the piezoelectric vibrator. A rigid member (124) is provided on the visco-elastic member (121), the rigid member having a specific gravity which is larger than a specific gravity of the visco-elastic member. This is implicit in the discussion of 124 at column 12, lines 18-37. An element (124) is provided in a central portion of the visco-elastic member, at least one of specific gravity and elastic modulus of the element being larger than specific gravity and/or elastic modulus of the visco-elastic member. Note that as one member is rigid and one is compliant, the claimed characteristics are met. The device further comprises a lead wire (see fig. 9, wire is not numbered) for applying an electric input to the piezoelectric member, wherein the piezoelectric vibrator has at least one through hole (not numbered, bottom, center-right of casing) through which the lead wire is coupled to the piezoelectric member. The device further comprises a cover (18) for protecting at least one said visco-elastic member (7) and the piezoelectric vibrator. A conductive terminal for applying an electrical input to the piezoelectric member is provided within the cover (connected to the wire).

Claims 11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Kishi (US 4,654,554). Kishi shows (fig. 9) a piezoelectric loudspeaker comprising: a piezoelectric vibrator including a diaphragm (metal plate) and a piezoelectric member (not numbered) provided on at least one face of the diaphragm, the diaphragm being vibrated by the piezoelectric member; a frame (14) for supporting the piezoelectric vibrator; and a support element (16, 8) for supporting the piezoelectric vibrator at a

substantial center of the piezoelectric vibrator. The piezoelectric loudspeaker further comprising a visco-elastic member (7) provided on at least one face of the piezoelectric vibrator.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi (US 4,654,554) in view of Barr (US 5,161,200). Given the invention of Kishi as noted above, he fails to show the support element including a conductive portion which is in electrical contact with the piezoelectric vibrator, and an electrical input is applied to the conductive portion. Barr shows (fig. 1) a piezoelectric microphone comprising: a piezoelectric vibrator including a diaphragm (13) and a piezoelectric member (14) provided on at least one face of the diaphragm (13); a frame (5) for supporting the piezoelectric vibrator; and a conductive portion (18) which is in electrical contact with the piezoelectric vibrator, and an electrical input (18) is applied to the conductive portion (15). He doesn't show a loudspeaker per se or a central support. He does not show a support element for supporting the piezoelectric vibrator at a substantial center of the

piezoelectric vibrator. It would have been obvious to one having ordinary skill in the art to employ an electrical connection at a central location in the device of Kishi, such as is shown by Barr since this would shorten the wire within the device and lessen the risk of unintentional snags or electrical shorts of the wire.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rapps et al. (US 5,446,332) in view of Massa (US 2,427,062). Rapp shows (e.g. fig. 6c) a piezoelectric loudspeaker comprising: a piezoelectric vibrator including a diaphragm (3) and a plurality of piezoelectric members (2, 4) provided on at least one face of the diaphragm (3), the diaphragm being vibrated by the plurality of piezoelectric members (2, 4); and, a frame (1) for supporting the piezoelectric vibrator. He does not show a voltage applying means for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. Massa shows (fig. 8) a piezoelectric loudspeaker (col. 6, ll. 70-72) comprising: a piezoelectric vibrator including a base (41) and a plurality of piezoelectric members (45, 46) provided on at least one face of the base (41), the base being vibrated by the plurality of piezoelectric members (2, 4); and, a frame (36) for supporting the piezoelectric vibrator. He shows a voltage applying means (electrical leads) for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. See claim 8 especially where it is clearly stated that the voltages applied to the piezoelectric elements differ. Massa does not show a component that can be construed as a diaphragm. It would have been obvious to one having ordinary

skill in the art to have the ability for applying a plurality of at least two voltages to the invention of Rapps et al. as is taught by Massa since this would make the device more versatile in its output.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being anticipated by Miki (JP 3-175800). Miki shows (figs. 1a and 1b) a piezoelectric loudspeaker comprising: a piezoelectric vibrator including a diaphragm (2) and a plurality of piezoelectric members (1) provided on at least one face of the diaphragm (2), the diaphragm being vibrated by the piezoelectric members (1); and, a frame (5) for supporting the piezoelectric vibrator. He does not show a voltage applying means for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. The device further comprising a visco-elastic member (6) provided on at least on face of the piezoelectric vibrator. Massa shows (fig. 8) a piezoelectric loudspeaker (col. 6, ll. 70-72) comprising: a piezoelectric vibrator including a base (41) and a plurality of piezoelectric members (45, 46) provided on at least one face of the base (41), the base being vibrated by the plurality of piezoelectric members (2, 4); and, a frame (36) for supporting the piezoelectric vibrator. He shows a voltage applying means (electrical leads) for applying a plurality of voltages; wherein at least two of the plurality of piezoelectric members have a different voltage applied thereto from the voltage applying means. See claim 8 especially where it is clearly stated that the voltages applied to the piezoelectric elements differ. Massa does not show a component that



can be construed as a diaphragm. It would have been obvious to one having ordinary skill in the art to have the ability for applying a plurality of at least two voltages to the invention of Miki et al. as is taught by Massa since this would make the device more versatile in its output.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miki (JP 3-175800) and Massa (US 2,427,062) in view of Kitanishi (US 5,321,761). Given the combined invention of Miki and Massa as noted above, said combination doesn't show the input to at least one of the plurality of piezoelectric members as being via an electrical resistance. Kitanishi shows (figs. 2 and 7) a piezoelectric sound generator comprising: a piezoelectric vibrator including a diaphragm (20) and a piezoelectric member (21) provided on at least one face of the diaphragm (20), the diaphragm being vibrated by the piezoelectric member (21); and, a frame for supporting the piezoelectric vibrator. He notes (fig. 7) the input to the piezoelectric member as being via an electrical resistance (e.g. 4). He doesn't show a plurality of piezoelectric members and his device is not a loudspeaker. It would have been obvious to one having ordinary skill in the art to apply to the input of at least one of the plurality of piezoelectric members of Miki's and Massa's combined device as being via an electrical resistance in order to reduce the chance that an overvoltage is applied, thereby preventing damage to the device.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miki (JP 3-175800). Given the invention of Miki as noted above, he further shows a diameter of the visco-elastic member being smaller than the inner diameter of the frame but he

doesn't show the bottom face area of the visco-elastic member as being equal to or greater than the bottom face area of the piezoelectric member. It would have been an obvious matter of design choice to so size the visco-elastic member since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 2377 (CCPA 1955).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miki (JP 3-175800) in view of Knecht (US 5,577,319). Given the invention of Miki as noted above, he doesn't discuss use of a conductive portion in the frame which is in electrical contact with the piezoelectric vibrator and an electrical input is applied to the conductive portion. Knecht notes a conductive frame for connection to different electrical elements including a piezoelectric element at col. 3, lines 10-17. He doesn't note a piezoelectric loudspeaker structure. It would have been obvious to one having ordinary skill in the art to employ the teaching of Knecht, that being use of a conductive frame or portion thereof, in the device of Miki at the time of his invention thereby eliminating the necessity for wiring within the device and presenting thus, the risk of disconnection of the wire, resulting in electrical short circuits.

#### ***Allowable Subject Matter***

Claim 2, 4, 5, 7, 8, 10 and 17-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Direct inquiry concerning this action to Examiner Dougherty at (703) 308-1628.

*tmd*  
tmd

April 9, 2002

*Thomas M. Dougherty*

THOMAS M. DOUGHERTY  
PRIMARY EXAMINER  
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*2800*